



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of)

Inventor: RUST ET AL.)

Title: ROOFING SYSTEM AND SELF-
BRIDGING TAPE FOR MODULAR
BUILDING CONSTRUCTION ROOF
JOINTS)

Serial No. 10/701,153)

Filing Date: 11/03/2003)

Examiner LAUX, JESSICA L.

Group Art Unit 3635

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION OF PRIOR INVENTION IN THE UNITED STATES
OR IN A NAFTA OR WTO MEMBER COUNTRY
TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131)**

I, **Kurt J. Fago**, a citizen of the United States of America, currently residing at 14797 Misty Meadow Lane, South Beloit, Illinois, 61080, formerly residing at 418 Oakland Ave., Apt #6, South Beloit, Illinois, make this declaration to establish completion of the invention in the above-identified Application in the United States on a date prior to May 22, 2002 that is the effective date of the reference publication US 2003/0219564 (Hubbard) that has been cited by the examiner, and in support thereof, declare as follows:

1. I and Paul Raymond Rust (collectively "we") of Evansville, Indiana, are co-inventors of the invention in the Application.
2. Prior to November 1, 2001, we conceived of and developed the invention (the "self-bridging tape") as shown, described and claimed in the Application.
3. The commercial product that embodies the invention is manufactured by RPD Inc. of Evansville, Indiana ("RPD"), and is sold by Mule-Hide Products, Inc. of Beloit, Wisconsin ("Mule-hide") under the name Self-Bridging Mate-Line tape.

4. I am and have been at all times mentioned herein employed at Mule-Hide.

5. This Declaration is submitted with

(a) a DECLARATION OF PRIOR INVENTION IN THE UNITED STATES OR IN A NAFTA OR WTO MEMBER COUNTRY TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131) by Paul Raymond Rust (the "Rust 131 Declaration").

(b) a RULE 132 DECLARATION by Paul Raymond Rust (the "Rust 132 Declaration"), and

(c) a RULE 132 DECLARATION by myself (the "Fago 132 Declaration").

6. Prior to March 7, 2002, I had received samples of the self-bridging tape from Paul Rust, had used and tested the self-bridging tape, and had found the self-bridging tape to perform satisfactorily for its intended purpose.

7. By March 7, 2002, the self-bridging tape was a fully developed commercial product manufactured by RPD and sold by Mule-Hide.

8. On March 7, 2002, I sent a fax to David Mercer, who was at the time the plant manager at RPD. A true and correct copy of this fax is attached to the Rust 131 Declaration as Exhibit A, except that all of the hand-writing on this copy was not on my fax to David Mercer. In the first paragraph of this fax, I was requesting "more tapes" from RPD which refers to the Mate-Line tape (not the Self-Bridging Mate-Line tape). In the second paragraph of this fax, I was also requesting the self-bridging tape material with the scrim hanging out for the purpose of taking pictures for press releases and sell sheets.

9. On about April 8, 2002, I sent a fax to Attorney Keith Frantz with information on the completed Invention. A true and correct copy of this fax is attached hereto as Exhibit A, with a supporting declaration from Attorney Frantz attached hereto as Exhibit B.

(a) Referring to page 1 of my fax shown in Exhibit A, "Larry Punzel" was at that time an employee of Mule-Hide.

(b) Pages 2-4 of my fax shown in Exhibit A are a reproduction of a fax from Pam Mereness who was an employee of Mule-Hide and coordinating initial arrangements concerning a possible patent application, to Attorney Paul Davis of law firm of Leo and Associates, of Huntsville, Alabama who were corporate counsel for Mule-Hide.

(c) Pages 3-4 of my fax shown in Exhibit A (which are pages 2-3 of the Mereness fax) is a disclosure of the Invention prepared by Paul Rust. I obtained a copy of the Mereness fax as co-inventor and employee of Mule-Hide. This disclosure shows the Invention as conceived of and developed prior to May 22, 2002.

(d) Page 5 of my fax shown in Exhibit A is a photocopy of a sell sheet for the earlier Mate-Line Bridging System (which is not the Self-Bridging Mate-Line product according to the invention) that was being sold by Mule-Hide at that time.

(e) Page 6 of my fax shown in Exhibit A is a reproduction of an article from a trade journal announcing completion of construction of modular building units in early 2002 for the Salt Lake City winter Olympics. As indicated in the article, these building units were constructed with the self-bridging tape of the Invention, and that the self-bridging tape had performed satisfactorily for its intended purpose. This article was published in the April 2002 issue of "RSI: Roofing, Siding, Insulation" (Vol. 79, Issue 4, page 12. This article is further evidence that the self-bridging tape of the Invention had been conceived of, made and used with satisfactory results, prior to May 22, 2002.

(f) Page 7 of my fax shown in Exhibit A is an excerpt from Mule-Hide assembly instructions for using the new Self-Bridging Mate-Line tape, which was the commercial product of the self-bridging tape of the Invention. This excerpt shows that the commercial product embodying the self-bridging tape of the Invention was completed prior to May 22, 2002.

(g) Pages 8-9 of my fax shown in Exhibit A is an excerpt from Mule-Hide assembly instructions for using the earlier Mate-Line tape.

10. On 11/01/2002, we filed US Provisional Patent Application S/N 60/423,069 for the Invention. A copy of the provisional application is attached hereto as Exhibit C, with a supporting declaration from Attorney Frantz attached hereto as Exhibit B.

11. The present Application was filed while copending with and claiming priority to US Provisional Patent Application S/N 60/423,069 on 11/01/2002.

12. The evidence presented and the documents and things identified above and attached hereto, in conjunction the Rust 131 Declaration, establish conception, diligence and completion of the Invention in the United States prior to May 22, 2002, which is a date earlier than the effective date of the reference.

13. This Declaration is submitted with a request for continued examination of the Application.

14. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the Application and any patent issuing thereon.

Co-Inventor: Kurt J. Fago

Inventor's Signature: _____

Kurt J. Fago

Date: 19 December 2008

Signed at: Beloit, Wisconsin

Residence: 14797 Misty Meadow Lane, South Beloit, Illinois, 61080

Citizenship: United States of America

Permanent Residency: United States of America

Post office Address: same as Residence above

In re application of

Inventor: RUST ET AL.

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Group Art Unit 3635

EXHIBIT A
TO
DECLARATION OF PRIOR INVENTION IN THE UNITED STATES
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TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131)

BY KURT J. FAGO

Brief Description: Fax communication dated April 8, 2002 from Kurt J. Fago to Attorney Keith Frantz (9 pages total), with:

- (a) a fax cover sheet (1 page),
(b) a fax from Pam Mereness of Hide-Hide to Attorney Paul Davis (3 pages)

which includes

- (c) a disclosure of the Invention dated March 25, 2002 (2 pages),
(d) sell sheet for Mate-Line tape (1 page),
(e) article published in April 2002 issue of "RSI: Roofing, Siding, Insulation" (Vol. 4, page 12 (1 page),

and

- (g) excerpt from assembly instructions for Self-Bridging Mate-Line tape (2).

APR-09-2002 14:39

MULE-HIDE PRODUCTS

608 365 7852 P.01

2924 Wyetta Dr.
Beloit, WI 53511
800/786-1492

Mule-Hide Products

Fax

| | | | |
|---------------|----------------------------------|---------------|-----------|
| To: | Keith Frantz | From: | Kurt Fago |
| Fax: | 815/987-9839 815/987-9869 | Pages: | 5 |
| Phone: | 815/987-9820 | Date: | 4/8/2002 |
| Re: | Patent information | CC: | |

☒ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Keith, here is the information you requested from Larry Punzel on Friday. If you could forward your telephone number for questions and e-mail address for additional information from our marketing department we would appreciate it. Thanks.

APR-09-2002 14:39

MULE-HIDE PRODUCTS

608 365 7852

P.02

Phone: 608/365-3111

Fax: 608/365-7852

MULE-HIDE PRODUCTS

Fax

To: PAUL DAVIS

From: PAM MERENESS

Fax: (256) 539-6024

Pages: 3

Phone: (256) 539-6000

Date: 3/27/02

Re: Self-Bridging Mate-line Patent:

☐ Urgent

☐ For Review

☐ Please Comment

☐ Please Reply

☐ Please Recycle

Message:

PER OUR DISCUSSION OF LAST WEEK, FOLLOWING
IS THE INFORMATION YOU REQUESTED CONCERNING
OUR ATTEMPT TO PATENT OUR SELF-BRIDGING
MATE-LINE PRODUCT.

PLEASE CONTACT EITHER ME OR KURT FAGIO
IF YOU HAVE ANY QUESTIONS.

RPD, Inc.
5248 Agri Ct Evansville IN 47725

Elastomer & Adhesive Specialist

PH: 312-868-0790 FX: 868-0787

E-mail: sealrpd@aol.com

March 25, 2002

Pam Mercness
Kingstree-Mulehide
2924 Wyetta Drive
Beloit WI 53512

Attn: Pam
608-365-7852 Faxed 3/26/02 Per Paul Rust

Abstract

A lamination of an elastomeric rubber adhesive re-enforced fully or partially with a structural membrane in addition with or without an additional rubber or plastic membrane that protects the re-enforced adhesive elastomer designed to bridge a construction joint or gap.

Past methods of bridging gaps in roofing or construction joints has been to use a re-enforced outer membrane or a separate membrane laid over the joint before the adhesive/protective membrane was applied. This prevented the sagging of the tape into the gap or joint.

Re-enforcement in the outer membrane produces stiff and non-conforming seals resulting in problems of poor sealing of the joint. This will produce high percentage of leaking joints.

The separate membrane used to bridge the joint poses the same problems as a re-enforced outer membrane with the added problem of requiring additional labor and material costs.

This invention addresses all of the problems while being cost affective during the manufacturing and application process.

Claim #1

A lamination composed of:

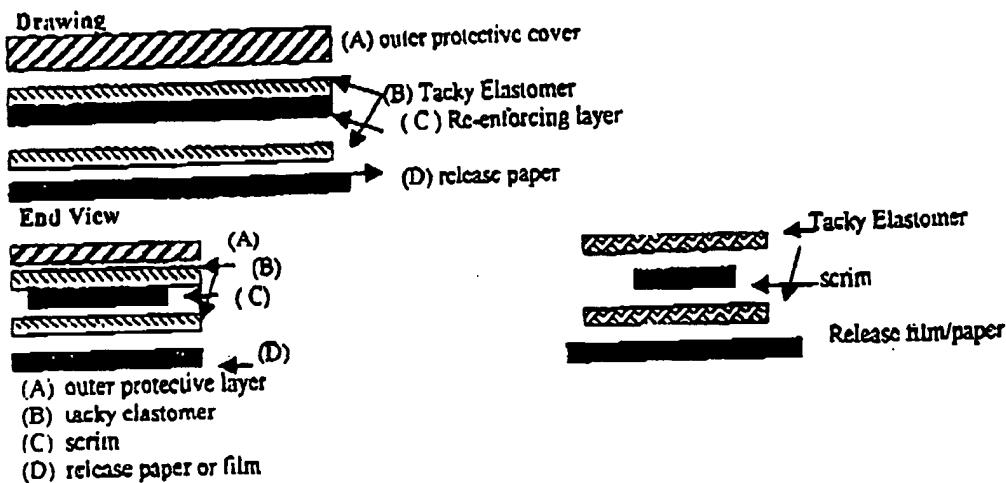
- (1) A tacky elastomeric adhesive tape consisting of one or more of the following elastomer: Butyl, EPDM, EPR, TPO, Neoprene, Polyisobutylene, Halogenated Butyl or Halogenated polyisobutylene reclaimed butyl or natural rubber.
- (2) A re-enforcing layer embedded in part or all of the tacky elastomeric adhesive tape to produce a self-bridging effect with in the adhesive composed of scrim embedded in the adhesive portion that is made of plastic, cloth, metal or other porous material.

Claim #2

- (1) A Tacky elastomeric composed of a cross-linked EPDM, Butyl or Halogenated Butyl, Polyisobutylene, Halogenate polyisobutylene or other cross-linked elastomer using an embedded re-enforcement in the tacky elastomer portion of cross-linked elastomers.
- (2) The cross-linked tacky elastomeric adhesive tape consisting of one or more of the following elastomers: Butyl, EPDM, EPR, TPO, Neoprene, Polyisobutylene, Halogenated Butyl, Halogenated Polyisobutylene reclaimed butyl or natural rubber with a non-tacky section added during production or after application.

Claim #3

The re-enforcing material may consist of but not limited to a plastic Scrim, an absorbent cloth, wire mesh or any material that will allow the tacky elastomer to penetrate or bond through reinforcing layer thereby producing a double sided adhesive tape.

**Summary of Invention**

To make an elastomeric seal on roofs, walls and concrete joints that allows bridging of imperfect fitting joints with or without sagging of the seal into the joint or gap. It also allows for a cost effective alternative to the present method of using two separate products to bridge or a re-enforced (with in the outer membrane) that does not conform as well with inherent edge lifting problems due to the stiff nature of the outer covers re-enforcement. This invention addresses the problems and reduces labor installation time while still maintaining the ease of cutting the membrane at a later time to disassemble the unit or inspect the joint.

APR-09-2002 14:39

MULE-HIDE PRODUCTS

608 365 7852 P.05

Modular Roofing
requires
custom products,
custom FIT



EPDM Mate-Line Bridging System

Mule-Hide understands the special needs of Multi-Unit setups. We've custom designed a Mule-Hide Mate-Line Bridging System specifically for EPDM single-ply roofing systems.

Components are easy to use and easy to install

Step 1 - Prep the mate-line areas

- Must be free from protruding fasteners
- All anchor bolts connecting roofs (units) must be even with the surface
- Roof (unit) edges must be even and tight
- Apply Mule-Hide Seam Cleaner with clean, dry rags to remove any dirt, dust or contaminants.

Step 2 - Prepare the EPDM

- Apply Mule-Hide Tape Primer with Scotch-Brite® pads
- Lay down Mule-Hide Bridging Material

Step 3 - Install the Mate-Line Tape

- Mule-Hide Mate-Line Tape - 9", 12", or 18" widths

System Benefits

Easy to Install - It really is as simple as 1 - 2 - 3. Setup crews quickly learn this system and dealers love it's economical speed of installation and dismantling.

Flexibility - Mule-Hide Mate-Line Tape stays flexible in hot and cold temperatures so it will not crack from building movement.

Strength & Performance - This "sealant adhesive" tape provides a consistent thickness of material within the mate-line for performance you can trust.

Long Lifecycle - Stands up to UV rays and the punishment of rain, hail and wind.

www.mulehide.com

Customer Support
800-786-1492

**MULE-HIDE
PRODUCTS**

"NOT A P.C.K.
OR
MILLION FEET"

MULE-HIDE PRODUCTS CO., INC.

2924 Wyeta Dr.
Beloit, WI 53511-3964

Phone (608) 365-3111
Fax (608) 365-7852

PO Box 1057
Beloit, WI 53512-1057

"The name trusted in roofing since 1906"

Scotch-Brite® is a registered trademark of 3M Corporation.

Newsbreak

EPDM tops new Salt Lake "modular city"

SALT LAKE CITY—Resun Leasing announced the completion of 500+ units specially built for and setup to

provide temporary buildings for the 2002 Salt Lake City winter events. The factory built structures were specified for construction with the Mule-Hide EPDM Roofing System. In total, Resun supplied nearly 800 units for use at the 15 venues in and around Salt Lake City.

"Mule-Hide was awarded the specification by Resun due to our proven performance in delivering professional roofing systems designed for the unique needs of modular construction and multi-unit setups," said Walt Griffin, Mule-Hide modular program manager. "Both modular dealers and manufacturers trust Mule-Hide to provide total roofing systems and work with them to ensure compatibility and related performance of interfacing products."

"The Snow Basin buildings had to be designed for 150-pound snow loads and set atop scaffolding in an area with 80 mph wind gusts," said Scott Zweifel, Resun corporate headquarters project communications manager. "The Mule-Hide EPDM fully adhered roofing system met these tough requirements. Mule-Hide's new Self-Bridging Mate-Line dramatically saves labor on multi-unit setup and dismantling."

Mule-Hide Modular Roofing Systems are sold nationwide and in Canada at 21 local distributors near modular plants and offices.

Simulated slate shingles used on historic courthouse

Architect Schooley Caldwell wanted to restore the historic Somerset, OH courthouse to the authentic look and feel of the 1820s with a slate roof but was concerned that the building would no longer be able to accommodate real slate. So they chose MiraVista Slate shingles from Owens Corning. These lightweight, simulated slate shingles offer the look of actual hand-chiseled slate without the weight of a traditional slate roof.



Aluminum

Resin-Based Coatings for Metal Roofing

Kynar 500 PVDF based metal coatings are the premier finishes in the business. The ability to resist weathering, aging, and pollution is unparalleled. They won't fade or chalk for decades.

When compared to other coating technologies, Kynar 500 resin based finishes clearly deliver superior long-term performance. Available in a range of colors, they offer great design flexibility.

Kynar 500 PVDF based metal coatings are a value added feature to any metal roof.

To learn more about the Big Dog in metal coatings, call 800.KYNAR.500, or log on at www.kynar500.com

KYNA

Setup Instructions and Guidelines

Warning: Solids Adhesive Membrane Cleaner, Tape Primer, and Solvent are recommended in this guide and are used label products. Lap Sealant and Water Cure are also solvent based products. Be sure to read all labels for the containers and appropriate MSDS and PDS for each product prior to use.

For the purpose of this guide, a mate-line is the junction of two modular units. This is the joint formed when two units are secured to each other. The walls that are butted together are referred to, in this guide, as marriage walls.

A. Mule-Hide Self-Bridging Mate-Line™ Assembly

Note: Mule-Hide Modular Standard System Warranties are only available if Mule-Hide Self-Bridging Mate-Line™ is used as bridging material.

Joining of Multiple Modular Units using Self-Bridging Mate-Line™:

1. This Mule-Hide Mate-Line assembly consists of Self-Bridging Mate-Line™ and Tape Primer. These components are used to seal the EPDM roof system at the junctions of multiple modular units.

Note: Do not remove the EPDM membrane from marriage walls of multiple units.

2. Optional - Install backer rod (rope style foam insulation) or insulation in the gap between the units to fill the void (See details at end of this handbook).

3. If dirt is present, clean the roof area to be covered with Self-Bridging Mate-Line™ with a solvent (toluene or xylene) and a Scotch-Brite® pad (scrub pad). Excessive dirt may require cleaning with soap and water prior to cleaning with solvent. Follow this with a clean cotton cloth saturated with solvent. Turn the cloth frequently and dispose when dirty. Do not use gasoline to clean the EPDM surface!

4. Let the solvent completely evaporate.

5. Once the solvent has evaporated, using a Scotch-Brite® pad, apply Tape Primer to the roof area along each unit where the Self-Bridging Mate-Line™ will be installed. Extend the coverage enough so that primer is visible once the tape is installed. Seam Cleaner cannot be used as a substitute when using Tape!

6. Starting at the building edge, using a pen or marker, on the EPDM membrane, mark an alignment line (parallel to the mate-line) for the Mate-Line Tape. This alignment line should center the tape over the mate-line joint. It is only necessary to mark a line 5' to 10' from the edge of the structure. Mark positioning points every couple of feet the remaining distance. The release paper on the roll and a good eye will help keep it centered. Do not use a chalk line as the chalk dust may affect the bond.

7. Starting at the building edge, roll out approximately 5' of the Self-Bridging Mate-Line™. Position the 5-foot section with the edge of the structure and along the alignment line. Lifting the 5-foot section, peel back the release paper. Set the Self-Bridging Mate-Line™ back in place along the alignment line. Roll the 5-foot section with a 2" steel or nylon roller. Roll the large roll back onto the 5-foot section. Insert a 2" x 24" piece of plastic through the cardboard roll in the core. With your weight on the release paper, start rolling (with a steady motion) the Self-Bridging Mate-Line™ over the mate-line. The release paper should come free as the Self-Bridging Mate-Line™ is rolled down the length of the mate-line. If the release paper becomes too long to manage, simply cut it off.

8. Using a 2" wide steel or nylon roller, pressure roll the Self-Bridging Mate-Line™ across its width and then roll it a second time in a lengthwise direction.

9. Use Mule-Hide Lap Sealant (Caulk) at all end laps (where the end of one Self-Bridging Mate-Line™ overlaps the next strip) and "T"-laps (where one strip of Self-Bridging Mate-Line™ intersects and crosses over another strip of Self-Bridging Mate-Line™). Do not towel the Lap Sealant. The Lap Sealant should be applied at a rate of about 20 linear feet per tube. Lap

Sealant shall be applied along the cut edge (end) of the strip and along the sides of the strips, 3" in each direction from the point of overlap or intersection of two strips.

B. Mule-Hide Mate-Line Assembly (Mate-Line Tape)

Joining of Multiple Modular Units Using Mate-Line Tape:

1. This Mule-Hide Mate-Line Assembly consists of Mate-Line Tape, Tape Primer, and Bridging Material. These components are used to seal the EPDM roof system at the junctions of multiple modular units.

Note: Do not remove the EPDM membrane from marriage walls of multiple units. However, if the membrane is removed from the marriage walls and used to cover over the bridging material, the membrane must be adhered to bridging material and the roof membrane with the Splice Adhesive. The EPDM membrane may need to be stripped with Mate-Line Tape to seal holes caused by the temporary attachment.

2. Optional - Install backer rod (rope style foam insulation) or insulation in the gap between the units to fill the void (See details at end of this guide).

3. If dirt is present, clean the roof area to be covered with the Mule-Hide Mate-Line Tape with a solvent (toluene or xylene) and a Scotch-Brite® pad (scrub pad). Excessive dirt may require cleaning with soap and water prior to cleaning with solvent. Follow this with a clean cotton cloth saturated with solvent. Turn the cloth frequently and dispose when dirty. Do not use gasoline to clean the EPDM surface!

4. Let the solvent completely evaporate.

5. Once the solvent has evaporated, using a Scotch-Brite® pad, apply Mule-Hide Tape Primer to the roof area along each unit where the Mate-Line Tape will be installed. Extend the coverage enough so that primer is visible once the tape is installed. Seam Cleaner cannot be used as a substitute when using Mate-Line Tape!

6. Bridging material:

- a. Bridging material such as 1/4" thick plywood with beveled edges, Thermal Ply, and others, if used, should be installed prior to applying Tape Primer. If bridging material is to be attached to the roof surface, use a back-out resistant fastener. Standard System Warranties are not available if using bridging material other than Mule-Hide's Self-Bridging Mate-Line™.

- b. Mate-Line Tape must make contact to the primed EPDM roof surface a minimum of 3" on each side of the bridging material.

7. Starting at the building edge, using a pen or marker, on the EPDM membrane, mark an alignment line (parallel to the mate-line) for the Mate-Line Tape. This alignment line should center the tape over the mate-line joint. It is only necessary to mark a line 5' to 10' from the edge of the structure. Mark positioning points every couple of feet the remaining distance. The release paper on the roll and a good eye will help keep it centered. Do not use a chalk line as the chalk dust may affect the bond.

8. Starting at the building edge, roll out approximately 5' of the Mate-Line Tape. Position the 5-foot section with the edge of the structure and along the alignment line. Lifting the 5-foot section, peel back the release paper. Set the Mate-Line Tape back in place along the alignment line. Roll the 5-foot section with a 2" steel or nylon roller. Roll the large roll back onto the 5-foot section. Insert a 2" x 24" piece of plastic pipe through the cardboard core in the roll. With your weight on the release paper, start rolling (with a steady motion) the Mate-Line Tape over the mate-line. The release paper should come free as the Mate-Line Tape is rolled down the length of the mate-line. If the release paper becomes too long to manage, simply cut it off.

9. Using a 2" wide steel or nylon roller, pressure roll the Mate-Line Tape across its width and then roll it a second time in a lengthwise direction.

10. Use Mule-Hide Lap Sealant (Caulk) at all end laps (where the end of one Male-Line Tape strip overlaps the next strip) and "T" laps (where one strip of Male-Line Tape intersects and crosses over another strip of Male-Line Tape). Do not towel the Lap Sealant. The Lap Sealant should be applied at a rate of about 20 linear feet per tube. Lap Sealant shall be applied along the cut edge (end) of the strip and along the sides of the strips, 3" in each direction from the point of overlap or intersection of two strips.

Splicing Seams with In-Seam Tape

~~This procedure should be followed when making a seam or when joining one roof membrane to another.~~

1. Make sure the top sheet is lapped over the bottom sheet in single fashion so water will flow over the seam edge and not against it.
2. All surfaces to be spliced shall be clean and dry. Overlap the adjacent membrane a minimum of 3' and fold back approximately 12" to allow for cleaning. Remove excess talc by wiping the seam area with clean damp rags. Dispose of all rags as they become dirty.
3. Prepare each surface of the seam by scrubbing the clean areas with Tape Primer using Scotch-Brite® pads. Preliminary cleaning may be accomplished by using the Scotch-Brite® pads and toluene or xylene. Additional cleaning may be required along the factory seams that intersect the seam area to remove excess accumulations of talc. Scotch-Brite® pads shall be replaced with clean ones as they become dirty. The Tape Primer should be thoroughly stirred prior to use. The primed membrane should have a uniform black color when dry. There should be no streaks present.
4. Roll the top sheet back over the bottom sheet and mark the bottom sheet to allow for proper alignment of the In-Seam Tape. Place marks about 1/2" away from the edge of the sheet and about 2 to 3 feet apart. Do not use a chalk line or any type of marker that will prevent the tape from adhering to the EPDM membrane.

5. Fold the top sheet back. Approximately 1/8" to 3/8" of the In-Seam Tape should be exposed along the completed seam. Unroll 2 to 3 feet of the In-Seam Tape leaving the release liner in place. Align the In-Seam Tape so that the edge of the release liner is touching the guideline (marks). Do not install the tape over the line (marks). Leaving the release liner in place, install the In-Seam Tape along the marks on the bottom sheet. Roll the tape with a 2" steel or nylon roller along the entire length of the seam. The roller must run perpendicular to the tape with overlapping strokes. If more than one piece (roll) of tape is required to complete a seam, the second piece of tape must overlap the first a minimum of 1 inch.
6. Where the In-Seam Tape intersects at the corner of a sheet, the tapes must overlap a minimum of 1 inch.
7. Fold the top sheet back on to the tape so the sheet is laying over the release paper. Peel the release paper off the tape at a 45 degree angle and parallel with the roof allowing the top sheet to fall freely onto the exposed tape. Press the seam together using hand pressure and wiping toward the splice edge. Immediately roll the seam with a 2" steel or nylon roller, using positive pressure toward the edge of the seam.
8. Wait a minimum of 2 hours prior to application of the Lap Sealant/ Lap Sealant is only required at the intersections with factory seams, where two pieces of tape overlap within the seam, and on patches installed over "T-joints". A bead of Lap Sealant should be applied along the overlap for 6" in each direction from the center point of the overlap.

Note: "T-joints" are those points where two field seams intersect or where two pieces of cured material (EPDM membrane) are seamed over a third piece (typically at the base of a vertical flashing where pieces overlap, at the base of a vertical flashing seam). "T-joints" are also referred to as "T-laps". This can also be referred to as the edge point where three pieces of material overlap.

9. Regardless of the method used to splice the seams, all seams must be thoroughly inspected for fishmouths,

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re application of |) | |
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| |) | |
| Serial No. 10/701,153 |) | Examiner LAUX, JESSICA L. |
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EXHIBIT B
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BY KURT J. FAGO

Brief Description: Supporting Declaration of Keith Frantz (2 pages).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|---------------------------------|---|---------------------------|
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| |) | |
| Inventor: RUST ET AL. |) | |
| |) | |
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| |) | |
| Serial No. 10/701,153 |) | Examiner LAUX, JESSICA L. |
| |) | |
| Filing Date: 11/03/2003 |) | Group Art Unit 3635 |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION IN SUPPORT OF
DECLARATIONS OF PRIOR INVENTION IN THE UNITED STATES
OR IN A NAFTA OR WTO MEMBER COUNTRY
TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131)**

I, **Keith Frantz**, a citizen of the United States of America, currently residing in Rockford, IL, and having an office at Suite 200, 401 West State St., Rockford, IL 61101, make this Declaration in support of (a) a DECLARATION OF PRIOR INVENTION IN THE UNITED STATES OR IN A NAFTA OR WTO MEMBER COUNTRY TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131) by **Kurt J Fago** (the "Fago Declaration"), to which this Declaration is attached as Exhibit B, and (b) a DECLARATION OF PRIOR INVENTION IN THE UNITED STATES OR IN A NAFTA OR WTO MEMBER COUNTRY TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131) by **Paul Raymond Rust** (the "Rust Declaration") which references the Fago Declaration and this Declaration, and hereby declare as follows:

1. I am a registered patent attorney, registration number 37,828, with the US Patent and Trademark Office, and I am the attorney of record in the above-identified

patent Application.

2. On about April 9, 2002, I received a fax communication, dated April 8, 2002, from Kurt J. Fago concerning an invention related to a self-bridging tape. The fax header on this fax indicates it was received on April 9, 2002, and I believe that date to be the correct date it was received at my office. A true and correct copy of this fax as received in my office is attached to the Fago Declaration as Exhibit A.

3. On November 1, 2002, Paul Raymond Rust and Kurt J. Fago filed U.S. Provisional Patent Application S/N 60/423,069 to which the present Application claims priority. I mailed this application pursuant to Express Mail procedures to the US Patent and Trademark Office. A true and correct reduced-size copy of this provisional application taken from my files is attached to the Fago Declaration as Exhibit C, together with the filing receipt for this application.

4. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the Application and any patent issuing thereon.

Signature: 
Keith Frantz

Date: 19 December 2008

Signed at: Rockford, IL

Residence: 1623 Crosby Street, Rockford, IL 61107

Citizenship: United States of America

Permanent Residency: United States of America

Post office Address: Suite 200, 401 West State St., Rockford, IL 61101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---------------------------------|---|---------------------------|
| In re application of |) | |
| |) | |
| Inventor: RUST ET AL. |) | |
| |) | |
| Title: ROOFING SYSTEM AND SELF- |) | |
| BRIDGING TAPE FOR MODULAR |) | |
| BUILDING CONSTRUCTION ROOF |) | |
| JOINTS |) | |
| |) | |
| Serial No. 10/701,153 |) | Examiner LAUX, JESSICA L. |
| |) | |
| Filing Date: 11/03/2003 |) | Group Art Unit 3635 |

EXHIBIT C
TO
DECLARATION OF PRIOR INVENTION IN THE UNITED STATES
OR IN A NAFTA OR WTO MEMBER COUNTRY
TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131)

BY KURT J. FAGO

Brief Description: Reduced size copy of U.S. Provisional Patent Application S/N 60/423,069, filed 11/01/2002 (30 pages printed on 8 sheets) and filing receipt (2 pages).

Under the Patent Protection Act of 1980, no person is required to respond to a collection of information unless it displays a valid OMB control number.

INVENTOR(S)
Given Name (first and middle if any) Family Name or Surname (City and either State or Foreign Country)
Paul Raymond Rust, Kurt J. Fago, Evansville, IN South Beloit, IL

☐ Additional inventors are being named on the _____ separately numbered sheets attached hereto.

TITLE OF THE INVENTION (250 characters max)
ROOFING SYSTEM AND SELF-BRIDGING TAPE FOR MODULAR BUILDING CONSTRUCTION ROOF JOINTS

Direct all correspondence to: CORRESPONDENCE ADDRESS
☒ Customer Number: 20506 Place Customer Number Bar Code Label here
OR
☐ Firm or Individual Name Type Customer Number here

Address _____
City _____ State _____ ZIP _____
Country _____

ENCLOSED APPLICATION PARTS (check all that apply)
☒ Specification Number of Pages: 25 ☐ CD(s) Number: _____
☐ Drawing(s) Number of Sheets: 2 ☒ Other (specify): Spec Cover Sheet

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT
☐ Applicant claims small entity status. See 37 CFR 1.27.
☒ A check or money order is enclosed to cover the filing fee: \$2,844
☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: _____
☐ Payment by credit card. Form PTO-523B is attached.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.
☒ No.
☐ Yes, the name of the U.S. Government agency and the Government contract number are: EU 55396128b US

Respectfully submitted, Kurt J. Fago Date: 11/10/02
SIGNATURE: Kurt J. Fago REGISTRATION NO. (if appropriate): 37828
TYPED OR PRINTED NAME: Keith Frantz Document Number: _____
TELEPHONE: 815-887-8820

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Key comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20513. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20513.

SPECIFICATION - US Provisional Patent Application

To whom it may concern:

Be it known that We, Paul Raymond Rust, a citizen of the United States, residing at 12247 Browning Street, Evansville, Indiana 47725, and Kurt J. Fago, a citizen of the United States, residing at 418 Oakland Ave., Apt #6, South Beloit, Illinois, have invented a new and useful ROOFING SYSTEM AND SELF-BRIDGING TAPE FOR MODULAR BUILDING CONSTRUCTION ROOF JOINTS, of which the following is a specification.

FEE TRANSMITTAL for FY 2002
Patent fees are subject to annual revision.
☐ Applicant claims small entity status. See 37 CFR 1.27.
TOTAL AMOUNT OF PAYMENT: (\$160.00)
Application Number: _____
Filing Date: _____
First Named Inventor: RUST
Examiner Name: _____
Group Art Unit: _____
Attorney/Agent No.: _____

METHOD OF PAYMENT (check all that apply)
☒ Check ☐ Credit card ☐ Money Order ☐ Other: _____
☐ Deposit Account: _____
The Commissioner is authorized to adjust all that apply:
☐ Charge fees indicated below ☐ Credit any overpayment
☐ Charge any additional fees during the pendency of this application
☐ Charge fees indicated below, except for the filing fee

| Fee Code (1) | Fee Code (2) | Fee Description | Fee Paid |
|--------------|--------------|-----------------|--|
| 100 | 130 | 60 | Search fee - 1st filing fee or each new filing |
| 127 | 55 | 27 | 25 |
| 130 | 130 | 130 | Non-English specification |
| 147 | 3,625 | 147 | 3,625 |
| 112 | 920 | 112 | 920 |
| 113 | 1,840 | 113 | 1,840 |
| 110 | 110 | 215 | 60 |
| 118 | 400 | 216 | 300 |
| 117 | 920 | 217 | 480 |
| 116 | 1,440 | 218 | 720 |
| 120 | 3,360 | 220 | 480 |
| 119 | 320 | 225 | 480 |
| 120 | 320 | 230 | 180 |
| 121 | 360 | 221 | 140 |
| 118 | 1,810 | 128 | 1,810 |
| 140 | 110 | 340 | 80 |
| 141 | 1,260 | 341 | 640 |
| 142 | 1,380 | 342 | 640 |
| 143 | 480 | 343 | 220 |
| 144 | 620 | 344 | 310 |
| 122 | 130 | 132 | 130 |
| 123 | 80 | 133 | 80 |
| 125 | 160 | 125 | 160 |
| 161 | 1,260 | 341 | 640 |
| 162 | 1,380 | 342 | 640 |
| 146 | 340 | 346 | 330 |
| 148 | 740 | 348 | 370 |
| 170 | 740 | 270 | 370 |
| 180 | 600 | 180 | 600 |

1. BASIC FILING FEE
Largest Entity: Small Entity
Fee Code (1) Fee Code (2) Fee Description Fee Paid
101 740 301 370 Entry filing fee
102 320 302 160 Design filing fee
103 510 303 250 Plant filing fee
104 340 304 370 Renewal filing fee
114 180 214 80 Provisional filing fee
SUBTOTAL (1) (\$160.00)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE
Total Claims: 100+
Multiple Dependent: 100+
SUBTOTAL (2) (\$)

3. ADDITIONAL FEES
Late Filing: Small Entity
Fee Code (1) Fee Code (2) Fee Description Fee Paid
101 740 301 370 Entry filing fee
102 320 302 160 Design filing fee
103 510 303 250 Plant filing fee
104 340 304 370 Renewal filing fee
114 180 214 80 Provisional filing fee
SUBTOTAL (1) (\$160.00)

4. OTHER FEES
Late Filing: Small Entity
Fee Code (1) Fee Code (2) Fee Description Fee Paid
101 740 301 370 Entry filing fee
102 320 302 160 Design filing fee
103 510 303 250 Plant filing fee
104 340 304 370 Renewal filing fee
114 180 214 80 Provisional filing fee
SUBTOTAL (1) (\$160.00)

5. SUBTOTAL (3) (\$)
SUBTOTAL (3) (\$)

SUBMITTED BY:
Name (Print/Type): Keith Frantz Registration No.: 37828
Signature: Keith Frantz Date: 11-10-02

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Best Prior Statement: This form is estimated to take 8.1 hours to complete. This fee is subject to annual revision. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20513. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20513.

ROOFING SYSTEM AND SELF-BRIDGING TAPE FOR MODULAR BUILDING CONSTRUCTION ROOF JOINTS

Background of the Invention

1. Field of Invention
The present invention relates generally to modular building construction materials and techniques.

More particularly, the invention relates to a membrane roofing system for buildings constructed from modular units, and a reinforced laminate tape that bridges and seals the gap at the roof between adjacent modules.

Description of Prior Art

One technique for constructing a building is to fabricate building modules at a manufacturing site, and then assemble the modules together at the building site.

Construction of modular buildings in this manner requires bridging the gap between adjacent modules, particularly at the roof line, after the modules are secured in position.

Building modules of this type are commonly provided with a membrane roofing sheet at the factory. Consequently, after assembly of the modules, the gap between the membrane sheets of adjacent modules must be bridged and sealed to establish a weather proof roof system for the finished building.

Roofing membranes are conventionally made from one or more of the following elastomeric/polymer compositions: EPDM, EPR, TPO, PVC, Neoprene, Butyl, Polyisobutylene, Halogenated Butyl, Halogenated Polyisobutylene, Isobutylene, reclaimed butyl, and natural rubber.

Roofing membranes are typically provided having a thickness of between approximately 0.030 inch to 0.060 inch, the thickness depending on circumstances and characteristics desired, as well as on the specific composition and

5 processing of the membrane.

In the construction of modular buildings, the gap between the adjacent modules at the roof line is typically less than 4 inches.

One common technique to establish a joint between
10 adjacent building modules is to install a relatively stiff bridging member over the gap, and then apply an adhesive-backed protective membrane, typically provided in the form of a tape, over the bridging material and overlapping onto the membrane roofing sheets of the adjacent modules. The
15 tape is to establish a water-tight seal between the modules, and the bridging material prevents sagging of the tape into the gap between the modules.

Another technique available for sealing the roofing gap between adjacent modules is to use an adhesive-backed tape
20 provided with a relatively stiff, fully cured outer membrane that is reinforced with an embedded scrim.

However, there are drawbacks and disadvantages associated with such prior construction techniques.

The reinforced outer membrane produces a non-conforming
25 joint that exhibits poor sealing characteristics. Consequently, the tape does not readily conform to irregular surfaces, and a relatively high percentage of joints develop leaks, resulting from the imperfect-fitting nature of joints between manufactured modules (e.g., as from manufacturing
30 tolerances), and from inherent uneven edge lifting of adjacent building modules as the modules expand and contract over time.

The seal established with the separate bridging material is also a stiff, non-conforming seal that results in the same sealing problems as are experienced with the reinforced outer membrane seal. Use of the separate

5 bridging material also results in substantial additional cost associated with the additional bridging materials and the additional labor and time required for preparation and installation of the bridging materials.

As a result of their stiff, non-conforming nature,
10 these prior seal arrangements are also relatively difficult to cut through and disassemble or remove in the event that the modules are to be disassembled, or should inspection or repair of the joint or underlying structure become necessary.

15 A completed roofing system in which the gaps between adjacent building modules are flexibly sealed without the above-identified drawbacks and disadvantages would be advantageous by reducing leaks and increasing joint reliability, reducing installation costs, and promoting ease
20 of removal, disassembly, inspection and repair activities.

Brief Summary of the Invention

25 The general aim of the present invention is to provide an improved roofing system for modular buildings.

Another aim of the invention is to provide materials and techniques for bridging and sealing the gaps between roofing membrane sheets of adjacent building modules,
30 without the above-identified drawbacks and disadvantages associated with prior materials and techniques therefor.

Important objectives of the invention include:

- providing for construction of modular buildings without the need to use a separate bridging member spanning across the gap between adjacent modules;

5 - providing a roof-joint seal that is less expensive than prior seal arrangements utilizing separate bridging and seal materials;

- providing a flexible elastomeric seal that bridges imperfect fitting joints commonly associated with adjacent building modules, without sagging into the gap therebetween;
10 - providing an elastomeric seal with an integral, flexible, self-supporting bridging material;

- providing a reinforced, flexible elastomeric laminate seal between the membrane roof sheets of adjacent building modules, thereby completing the roof system of the finished
15 building;

- providing a flexible elastomeric laminate seal that is also suitable for sealing between walls, concrete and other construction joints.

These and other objectives and advantages of the
20 invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Briefly, according to the invention, there is provided a reinforced, flexible, elastomeric, self-bridging laminate
25 tape to bridge and seal the gap between membrane roof sheets of adjacent building modules, and to complete the roof system of the finished building.

One preferred embodiment tape to bridge and seal the joints between construction modules is provided with
30 - a tacky elastomeric adhesive membrane,

- a porous semi-rigid reinforcing layer embedded in the elastomeric membrane such that the elastomer surrounds and extends through the reinforcing layer,

5 - an outer flexible, non-tacky protective membrane permanently adhered to and covering the outer side of the tacky elastomeric membrane, and

- a release strip temporarily adhered to and covering the inner side of the tacky membrane prior to installation of the tape.

10 The outer non-tacky layer is provided as a separate membrane layer that is permanently adhered to the outer side of the tacky adhesive layer, either as part of the tape manufacturing process or at the job site after application of the tape to the roof.

15 The reinforcing layer is provided in the form of an open-weave, porous, perforated, mesh, or other permeable structure strip that supports the weight of the tape when installed across a gap between modules, and that imparts the desired structural stiffness and flexibility characteristics
20 of the tape.

The elastomeric layers can be provided as non-cross-linked, partially cross-linked, or fully cross-linked layers, and they can be uncured, partially cured, or fully cured layers.

25 A preferred roofing system constructed in accordance with the invention includes membrane roofing sheets installed on adjacent building modules, and an elastomeric self-bridging laminate tape pursuant hereto installed across the gap between the roofing sheets of the adjacent modules.

30 Briefly, the building modules are secured in position adjacent one another, with factory installed membrane roofing sheets covering the modules. Adjacent edge portions

of the membrane sheets are cleaned and primed in preparation for installation of the tape. The self-bridging tape is then laid along the roof joint, spanning across the gap and overlapping the adjacent cleaned and primed edge portions of the roof membrane sheets. The tacky side of the tape is adhered to the roof membranes, and the non-tacky protective layer covering the outer surface of the tacky elastomer is exposed to provide an exposed weather resistant roof surface across the gap. The reinforcing laminate provides sufficient structural transverse stiffness to prevent the tape from sagging into the gap, while maintaining sufficient flexibility to permit expansion and contraction between the building modules, and rolling and unrolling of the tape without development of leaks along the joint.

Brief Description of the Drawings

Figure 1 is a perspective view of a building constructed from modular manufactured units that are connected together.

Figure 2 is a fragmentary cross-sectional view of a prior roof joint for mirrored building modules shown in Figure 1.

Figure 3 is a fragmentary cross-sectional view of the prior roof joint for side-by-side building modules shown in Figure 1.

Figure 4 is a view similar to Figure 2 but showing a roof system incorporating the unique aspects of the present invention, including a new and improved self-bridging roof-joint sealing tape and technique associated therewith in accordance with the invention.

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Figure 5 is a view similar to Figure 3 of the roof system and tape in accordance with the invention.

Figures 6A and 6B are longitudinal fragmentary cross-sectional views of the tape.

Figures 7 and 8 are fragmentary cross-sectional views similar to Figure 6A of alternate embodiment tapes in accordance with the invention.

Figure 9 is a plan view of one suitable reinforcing scrim in a tape according to the invention.

While the invention is susceptible of various modifications and alternative constructions, certain illustrated embodiments have been shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the invention to the specific forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention.

Reference numerals shown in the drawings correspond to the following:

- 10 - building
- 12a - building module
- 12b - building module
- 14 - membrane sheets
- 16 - roofing seal joint
- 16a - roof gap
- 18 - roofing seal joint
- 18a - roof gap
- 20 - bridging material
- 22 - adhesive/sealing tape
- 26 - caulk sealant

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- 28 - bridging material
- 30 - self-bridging tape
- 32 - tacky elastomer adhesive layer
- 34 - reinforcing layer
- 36 - outer protective layer
- 38 - release strip
- 40 - completed roof system
- 42 - roofing seal joint
- 44 - roofing seal joint
- 50 - alternate self-bridging tape
- 52 - cross-linked elastomer layer
- 54 - tacky side of cross-linked elastomer layer
- 56 - non-tacky side of cross-linked elastomer layer
- 60 - second alternate self-bridging tape

Detailed Description of the Invention

The present invention relates to a membrane roofing system for modular buildings, such as building 10 shown in Figure 1, and to a laminate tape for sealing joints between the membrane roofing sheets of adjacent building modules such as modules 12a and 12b shown.

For illustration purposes, the membrane roofing sheets 14 shown in the drawings terminate at the edges of the building modules 12a, 12b. However, the membrane roofing sheets are more typically provided folded over the edges of the modules, with a terminating strip securing the ends of the membrane to the sides of the modules.

One prior technique for establishing a roofing joint between the membrane sheets of adjacent building modules is

shown in Figure 2 in connection with sealing the roof joint 16a between mirrored adjacent building modules 12a, and in Figure 3 in connection with sealing roof joint 18a between side-by-side modules 12a and 12b.

Briefly, the seal joint 16 (Figure 2) is established by securing an elongated, rigid bridging material 20 over the gap 16a between the modules, and then installing a strip of adhesive/sealing tape 22 over the bridging material 20 and overlapping a strip of the membrane roofing sheet 14 along each side of the module to seal along both sides of the length of the gap.

In this instance, the bridge material 20 is configured in an inverted V-shape to span across the top of the building, and is sized to overlap onto the membrane sheets 14 on each modular unit. Insulation is optionally positioned in the gap to reduce heating and cooling losses from the building prior to securing the bridge member to the roof. Conventional bridging materials include 1/4 inch thick plywood, Thermal Ply, etc., with beveled edges to provide a smooth transition for the sealing tape extending therefrom to the membrane surface.

The tape 22 is adhesively secured over the bridging material 20 and to the membrane roofing sheets 14 along the length of the gap. The overlap between the tape and the membrane sheets is typically between 3 to 6 inches, with a more common overlap of approximately 4 inches. Cleaner and tape primer are used to prepare the membrane surfaces for optimum bonding with the tape. One suitable known primer includes a small percentage of butyl adhesive in a solvent base to encapsulate dust and dirt that remains after cleaning and to fill microscopic voids and cracks in the membrane substrate.

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The tape 22 is provided in a roll, with release paper (e.g., Kraft paper) on the tacky underside (as installed), the release paper being removed from the tape as it is unrolled over the joint.

5 An outer protective layer is provided over the joint 16, either as an outer layer integral with the tape, or as an additional strip that is adhered onto the outer exposed surface of the tape after the tape is secured in place over the bridging material.

10 The tape (and outer protective layer) are then secured in position on the roof with pressure, typically by rolling a roller along the length and width thereof.

The joint 16 is completed by sealing the butting, open and overlapping ends of the tape with a caulk sealant such as indicated at 26.

15 The roof joint 18 shown in Figure 3 is constructed in a similar manner, except that the bridging material 28 is a planar member to span across the flat junction between the modules 12a and 12b.

20 In accordance with one aspect of the present invention, a self-bridging laminate tape is provided to establish a sealing joint between membrane roofing sheets of adjacent building modules, and to establish a finished membrane roofing system for the modular building.

25 One embodiment of a self-bridging tape 30 according to the invention is shown in Figure 4 in connection with sealing the gap 16a between mirrored adjacent building modules 12a, and in Figure 5 in connection with sealing gap 18a between side-by-side modules 12a and 12b.

30 In carrying out this aspect of the invention, the tape 30, shown in detailed cross-section in Figures 6A and 6B, is provided with:

10

- a layer 32 of tacky elastomeric adhesive,
- a porous reinforcing layer 34 embedded in the adhesive layer 32,

5 layer 36 permanently adhered to and covering the outer surface of the adhesive layer 32, and

- a release strip 38 releasably adhered to and covering the tacky underside (as installed) of the adhesive layer 32.

The reinforcing layer 34, alternately referred to herein as scrim, is provided in the form of an open-weave strip of material comprising absorbent or loosely woven cloth, porous fiberglass fabric, wire or plastic screen-like mesh, perforated plastic or metal strip, or other porous or permeable material through which a non-solid may be forced.

15 The scrim extends the length of the tape, and is sufficiently wide to span the gap (e.g., 16a, 18a) between the modular building units.

As discussed further below, the scrim is designated to produce, in combination with the tacky adhesive and protective outer layer, certain structural and flexibility characteristics in the tape. These characteristics include, but are not limited to supporting the weight of the unsupported center portion of the tape when laid over a gap between adjacent building modules.

25 The tacky adhesive layer 32 covers each side of the reinforcing scrim 34, and extends through the pores or perforations or openings of the scrim to establish an integral adhesive layer in which the scrim is embedded (see Figure 6). The adhesive layer, with the reinforcing layer embedded therein, is provided with a thickness of between approximately 0.040 to 0.060 inch.

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The protective outer covering 36 and tacky adhesive layer 32 are formed from elastomeric compounds, and are preferably formed from material selected from, but not limited to, one or more of the following elastomer groups:

5 EPDM, EPR, TPO, PVC, Neoprene, Butyl, Polyisobutylene, Halogenated Butyl, Halogenated Polyisobutylene, Isobutylene, reclaimed butyl, natural rubber and Polydimethylsiloxane (PDMS).

10 The protective outer covering 36 and tacky adhesive layer 32 are further provided in either of an uncured condition, a partially cured condition, or a fully cured condition.

15 The protective outer covering 36 is a non-tacky, non-adhesive layer, with a thickness of between approximately 0.030 to 0.060 inch.

For aesthetic and functional compatibility, the protective outer covering is typically formed from the same or a similar base compound as the roofing membrane sheets with which the tape is to be used.

20 The tape 30 is provided in convenient widths for the roof joints to be bridged and sealed.

With a typical roof gap of 4 inches or less between installed building modules, and to an overlap between the tape and each of the adjacent roofing membrane sheets of 3 to 6 inches, the tape is provided at between 9 to 18 inches wide, with the widest tape enabling overlap onto fresh roof membrane surface for reassembling along joints that were previously disassembled.

25 To establish seal joints in new building construction, with a 4 inch gap and a 4 inch overlap, the preferred tape is provided with a width of 12 inches.

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The tape 30 is characterized as being (i) sufficiently flexible longitudinally to permit its being provided in a roll for storage, shipment, handling and unrolling onto the roof, and (ii) sufficiently flexible transversely (a) to conform to uneven edges between adjacent modules, and (b) to permit relative movement between the edges of the modules, without developing leaks, yet (iii) sufficiently rigid transversely when laid across the gap between adjacent modules to establish a self-supporting, non-sagging bridge over the gap. The scrim, in cooperation with the outer protective layer and the tacky adhesive layer, are specified to meet these characteristics.

The optimum tape hereof results in the center of the applied tape being fully self-supporting, with essentially zero sagging in the center of the tape. However, those skilled in the roofing membrane arts will recognize that the benefits of the invention will be achieved provided the scrim is specified such that the center of the tape sags no more than between approximately $\frac{1}{4}$ inch and $\frac{1}{2}$ inch when applied over the roof gap. In other words, a tape that exhibits a maximum of this relatively small deformation will not detrimentally affect the performance of the roofing system established therewith.

In one preferred embodiment, the tape 30 is formed with

25 - a tacky adhesive layer (32) that is a blend comprising primarily butyl in an uncured condition mixed with other polymers, some of which are in a semi-cured condition, resulting in a semi-cured adhesive layer, the adhesive layer having a width of 9 to 18 inches, and a thickness of 0.040 to 0.050 inch,

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- a reinforcing layer (34) in the form of a plastic polypropylene (or polyethylene) screen-like mesh (see Figure 9)

- having a width of between 4 inches (for use with a 4 inch gap) to 10 inches, depending on the maximum gap width to be covered,
- having a thickness of between approximately 0.030 inch to 0.050 inch, with a nominal thickness of 0.040 inch,
- with openings sized at approximately 1/16th to 1/8th inch across corners,
- a outer protective layer (36) of fully cured EPDM rubber (for use with EPDM roofing membranes), or other non-tacky protective rubber or plastic layer, permanently adhered to and covering the outer surface of the butyl adhesive layer, the cured non-tacky elastomer having a width of approximately 12 inches and a thickness of 0.030 to 0.060 inch, and
- a paper release strip releasably adhered to and covering the tacky underside of the adhesive butyl layer, the release paper having a width extending slightly beyond the width of the adhesive layer.

These designations result in a self-supporting tape that exhibits the previously identified characteristics, and that is capable of reliably bridging and sealing gaps between adjacent modules.

Alternate preferred designations of the tape constituents will meet the performance characteristics of the above-designated tape construction. However, it will be understood that the stiffness and flexibility characteristics of the scrim material will be the primary

factors in obtaining characteristics comparable with the above-designated embodiment.

A preferred method of forming the above-designated self-bridging tape 30 is a continuous conveyor-type process that includes the following steps:

- providing the release paper on a linearly moving conveyor,
- extruding the butyl adhesive blend (from processing mixers) onto the moving release paper,
- introducing the scrim onto the exposed face of the adhesive mixture and the elastomeric protective layer onto the scrim layer,
- passing the stacked release paper, adhesive layer, scrim and elastomeric protective layer continuously through one or more sets of opposing rollers to embed the scrim into the adhesive layer and to establish an initial adhesion between the adhesive layer and the elastomeric protective layer, and
- rolling the tape into tight rolls of predetermined lengths for stocking and delivery purposes.

Alternate methods of forming a self-bridging tape in accordance herewith will be readily devised by those skilled in the adhesive manufacturing arts. By way of example, and without limiting effect, the finished layer of reinforced tacky elastomer may be provided by extruding a first adhesive layer onto the release paper, laying the scrim strip onto the first adhesive layer, and then extruding a second adhesive layer onto the scrim such that the two adhesive layers will merge into a cohesive reinforced layer upon passing through the pressure rollers.

In carrying another aspect of the invention, the seal joints 42 and 44 of the finished roof system 40 of the building 10 are established by

- preparing strips along the edges of adjacent membrane roofing liners 14 with a cleaner and tape primer,
- optionally installing insulation in the gap 16a, 18a to reduce heating and cooling losses from the building ,
- unrolling the self-bridging tape 30 along the length of the gap between the adjacent modules, positioning the tape to overlap the cleaned and primed membrane surfaces, for an overlap of approximately 4 inches, and removing the release paper 38 from the underside of the tape as it is unrolled into position over the gap,
- securing the tape to the membrane sheets, in position over the gap, with pressure applied to the outer protective cover such as with a roller along the length and width thereof, and
- sealing the butting, open and overlapping ends of the tape with a caulk sealant 26.

In an alternate embodiment, the self-bridging tape 50, shown in detailed cross-section in Figure 7, includes:

- a layer 52 of cross-linked elastomeric compound provided with an adhesive tacky side underside 54 and a non-tacky outer side 56,
- a porous reinforcing layer 34 embedded in the tacky portion 54 of the cross-linked elastomer layer, and
- a release strip 38 releasably adhered to and covering the tacky underside 54 of the cross-linked elastomer layer.

The reinforcing layer 34 is integrally embedded in the cross-linked elastomer 52 during fabrication of the tape, with elastomer cross-links extending through the reinforcing layer to assist in bonding the reinforcing layer therein.

The cross-linked elastomer layer is preferably formed from a compound including, but not limited to, of one or more materials selected from the group consisting of the following elastomers: EPDM, EPR, TPO, PVC, Neoprene, Butyl, Polyisobutylene, Halogenated Butyl, Halogenated Polyisobutylene, Isobutylene, reclaimed butyl, natural rubber and Polydimethylsiloxane (PDMS).

The non-tacky side 56 of the elastomer is provided for during production of the tape as an elastic rubber or plastic protective layer integrally covering the tacky elastomer, commonly of the same or a similar material as the membrane roofing sheets with which the tape is to be used.

As with tape 30, the tape 50 is characterized as being (i) sufficiently flexible longitudinally to permit its being provided in a roll for storage, shipment, handling and unrolling onto the roof, and (ii) sufficiently flexible transversely to permit relative movement between the edges of the building modules without developing leaks, yet (iii) sufficiently rigid transversely when applied to the roof gap between adjacent modules to form a self-supporting, non-sagging bridge over the gap.

In one preferred embodiment, the tacky adhesive layer of tape 50 is formed from a compound of a pre-cross-linked butyl blend that cross-links further in-place over time, resulting in enhanced strength as time passes.

Alternately, a fully cross-linked adhesive layer may be provided during fabrication of the tape.

A finished roofing system is established for a modular building with tape 50 as described above in connection with tape 30.

In a second alternate embodiment, the self-bridging tape 60, shown in detailed cross-section in Figure 8, includes:

- a layer 32 of tacky elastomeric adhesive,
- a porous reinforcing layer 34 embedded in the adhesive layer, and
- at least one release strip 38 releasably adhered to and covering one side of the adhesive layer.

The tape 60 is similarly characterized as being (i) sufficiently flexible longitudinally to permit its being provided in a roll for storage, shipment, handling and unrolling onto the roof, and (ii) sufficiently flexible transversely to permit relative movement between the edges of the building modules without developing leaks, yet (iii) sufficiently rigid transversely when applied to the roof gap between adjacent modules to form a self-supporting, non-sagging bridge over the gap.

The finished roofing system is established with this tape 60 as generally discussed above, except that a non-tacky outer protective layer is applied to the exposed tacky side of the tape after the tape is applied on the job to the adjacent roofing membranes 14 and over the gap between the adjacent modules.

When provided after application of the tape over the gap, the non-tacky layer

- is preferably fabricated from, but not limited to, one or more of the following elastomers: EPDM, EPR, TPO, PVC, Neoprene, Butyl, Polyisobutylene, Halogenated Butyl, Halogenated Polyisobutylene, Isobutylene, reclaimed butyl, natural rubber and Polydimethylsiloxane (PDMS),

- is normally provided from the same elastomer family as the roofing membrane sheet with which the tape is to be used, and

- may be provided by the installer, either as a separate strip or by stripping in the membrane that is normally supplied draping over the edge of the building module.

In accordance with yet another aspect of the invention, the self-bridging tape disclosed herein may also be used to bridge and seal gaps between other structural construction members. For example, the tape may be used to seal gaps between walls, floors, concrete and other joints encountered in construction of buildings and other similar structures. The tape 60 without the protective cured layer may be used, for example, to bond a metal cap in position on the roof of a building, and may be used in combination with a tape 30, 40 having the cured layer for such purposes. The tape may also be used to seal joints such as in concrete sewer pipes, concrete culverts, concrete vaults. And the tape may be used to seal construction joints between the same as well as different substrates, including metal-to-metal, wood-to-wood, metal-to-wood, wood-to-concrete, metal-to-concrete, and rubber or plastic to itself or to any of the above-mentioned substrate materials.

In particular, it has been learned that the reinforced tape hereof, made with adhesive butyl blends, is suitable to bond to each of these, properly cleaned, and primed as required, substrates.

Alternately, as will be recognized by those skilled in the adhesive arts, a tacky adhesive layer of an alternate composition may be preferred for certain ones of these substrates. In such instances, the adhesive butyl will be

replaced by a tacky adhesive composition identified above to provide better adhesion with such substrates.

From the foregoing, it will be apparent that the present invention brings to the art a new and improved roofing system for modular building construction, and a unique tape which, by virtue of its self-bridging self-supporting, yet flexible characteristics, is adapted to bridge and seal the joints between the membrane sheets of adjacent construction modules, and to establish a finished membrane roofing system therefor, without the need for a separate bridge material or a stiff reinforced outer protective layer of prior roof-joint bridging systems. Accordingly, the invention eliminates the material and labor costs associated with cutting and installing separate bridging material of prior joint sealing arrangements, provides a seal with increased flexibility to reduce leakage associated with prior arrangements, and promotes ease of removal for disassembly, inspection and repair.

I/We claim:

1. A tape adapted to bridge the gap between adjacent building modules provided with roofing membranes, the tape comprising:
 - a tacky elastomeric adhesive layer having an underside and an oppositely facing outer face,
 - a porous reinforcing layer embedded in the adhesive layer,
 - a protective membrane layer permanently adhered to and covering the outer face of the adhesive layer, and
 - a release strip releasably adhered to and covering the underside of the adhesive layer.

2. A roofing system for buildings constructed from adjacent modular units, the roofing system comprising:

- roofing membrane sheets secured to the roof deck of the modular units, and

5 - a tape adhered to adjacent edge portions of the adjacent membrane sheets and spanning across the gap therebetween,

- the tape including:

- a tacky elastomeric adhesive layer having an underside and an oppositely facing outer face,

- a porous reinforcing layer embedded in the adhesive layer,

- a protective membrane layer permanently adhered to and covering the outer face of the adhesive layer,

15 and
- a release strip releasably adhered to and covering the underside of the adhesive layer.

3. A tape adapted to bridge the gap between adjacent building modules provided with roofing membranes, the tape comprising:

- a tacky elastomeric adhesive layer having an

5 underside and an oppositely facing outer face, the elastomeric adhesive including cross-linked polymers,

- a porous reinforcing layer embedded in the adhesive layer,

10 - a protective membrane layer permanently adhered to and covering the outer face of the adhesive layer, and

- a release strip releasably adhered to and covering the underside of the adhesive layer.

4. A tape adapted to bridge the gap between adjacent building modules provided with roofing membranes, the tape comprising:

- a tacky elastomeric adhesive layer having an

5 underside and an oppositely facing outer face,

- a porous reinforcing layer embedded in the adhesive layer, and

- a release strip releasably adhered to and covering the underside of the adhesive layer.

10

Abstract of the Disclosure

A membrane roofing system for buildings of modular construction includes a reinforced laminate tape that seals the roof joints between the modular building units. The tape includes a tacky elastomeric adhesive layer adhered to the membrane sheets of adjacent building modules, a reinforcing layer embedded in the tacky elastomer and bridging across the gap between the adjacent modules, and a protective layer covering the outer surface of the tacky elastomer.

FIG. 1

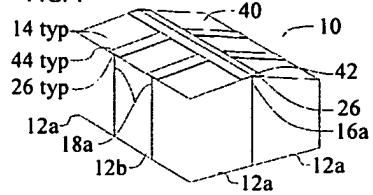


FIG. 2 - PRIOR ART

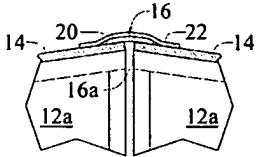


FIG. 3 - PRIOR ART

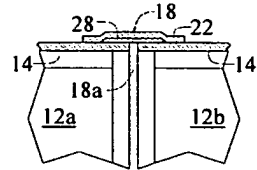


FIG. 4

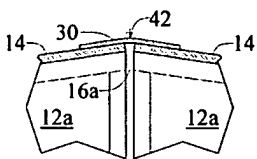


FIG. 5

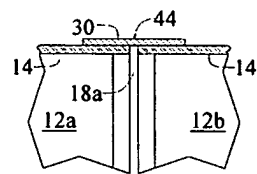


FIG. 6A

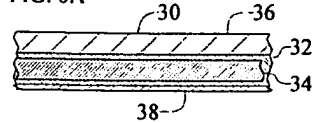


FIG. 6B

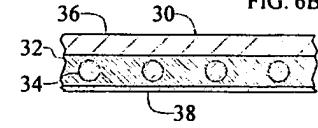


FIG. 7

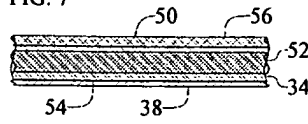


FIG. 8

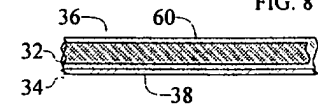
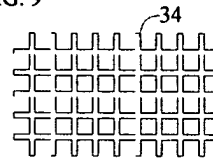


FIG. 9





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Washington, DC 20231
www.uspto.gov

| APPLICATION NUMBER | FILING DATE | GRP ART UNIT | FIL FEE REC'D | ATTY. DOCKET NO | DRAWINGS | TOT CLAIMS | IND CLAIMS |
|--------------------|-------------|--------------|---------------|-----------------|----------|------------|------------|
| 60/423,069 | 11/01/2002 | | 160 | | 2 | | |

20606
KEITH FRANTZ
401 WEST STATE STREET
SUITE 200
ROCKFORD, IL 61101



CONFIRMATION NO. 2764

FILING RECEIPT



OC00000009176032

Date Mailed: 11/29/2002

Receipt is acknowledged of this provisional Patent Application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Filing Receipt Corrections, facsimile number 703-746-9195. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)

Paul Raymond Rust, Evansville, IN;
Kurt J. Fago, South Beloit, IL;

If Required, Foreign Filing License Granted: 11/29/2002

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

Title

Roofing system and self-bridging tape for modular building construction roof joints

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---------------------------------|---|---------------------------|
| In re application of |) | |
| |) | |
| Inventor: RUST ET AL. |) | |
| |) | |
| Title: ROOFING SYSTEM AND SELF- |) | |
| BRIDGING TAPE FOR MODULAR |) | |
| BUILDING CONSTRUCTION ROOF |) | |
| JOINTS |) | |
| |) | |
| Serial No. 10/701,153 |) | Examiner LAUX, JESSICA L. |
| |) | |
| Filing Date: 11/03/2003 |) | Group Art Unit 3635 |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RULE 132 DECLARATION (37 C.F.R. 1.132)

I, **Kurt J. Fago**, a citizen of the United States of America, currently residing at 14797 Misty Meadow Lane, South Beloit, Illinois, 61080, formerly residing at 418 Oakland Ave., Apt #6, South Beloit, Illinois, make this declaration to establish attribution of a document concerning the Invention in the above-identified Application that has been cited by the examiner; and in support thereof, declare as follows:

1. I, and Paul Raymond Rust of Evansville, Indiana (collectively "we" or "our"), are co-inventors of the Invention in the Application.
2. Prior to November 1, 2001, we conceived of and developed the Invention (the "self-bridging tape") as shown, described and claimed in the Application.
3. The commercial product that embodies the Invention is manufactured by RPD Inc. of Evansville, Indiana ("RPD"), and is sold by Mule-Hide Products, Inc. of Beloit, Wisconsin ("Mule-hide") under the name Self-Bridging Mate-Line tape.
4. I am and have been at all times mentioned herein employed at Mule-Hide.
5. This Declaration is submitted with
 - (a) a RULE 132 DECLARATION by Paul Raymond Rust (the "Rust 132 Declaration"),

(b) a DECLARATION OF PRIOR INVENTION IN THE UNITED STATES OR IN A NAFTA OR WTO MEMBER COUNTRY TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131) by Paul Raymond Rust (the "Rust 131 Declaration"), and

(c) a DECLARATION OF PRIOR INVENTION IN THE UNITED STATES OR IN A NAFTA OR WTO MEMBER COUNTRY TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131) by myself.

6. Attached hereto as Exhibit A is a copy of the reference document cited by the examiner in the Notice of References Cited, accompanying the Office Action dated 02/28/2006, line "U", identified as "Mule-Hide Products, What's New News Release, Mule-Hide Introduces Self-Bridging Mate-Line, 11/01/2001, www.mulehide.com/news5.html" (the "reference document").

7. I swear and unequivocally state that the reference document attached as Exhibit A discloses our Invention, and the product identified therein is the self-bridging tape embodied in a commercial product according to our Invention.

8. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the Application and any patent issuing thereon.

Co-Inventor: Kurt J. Fago

Inventor's Signature: Kurt J. Fago
Date: 19 December 2008

Signed at: Beloit, Wisconsin

Residence: 14797 Misty Meadow Lane, South Beloit, Illinois, 61080

Citizenship: United States of America

Permanent Residency: United States of America

Post office Address: same as Residence above

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---------------------------------|---|---------------------------|
| In re application of |) | |
| |) | |
| Inventor: RUST ET AL. |) | |
| |) | |
| Title: ROOFING SYSTEM AND SELF- |) | |
| BRIDGING TAPE FOR MODULAR |) | |
| BUILDING CONSTRUCTION ROOF |) | |
| JOINTS |) | |
| |) | |
| Serial No. 10/701,153 |) | Examiner LAUX, JESSICA L. |
| |) | |
| Filing Date: 11/03/2003 |) | Group Art Unit 3635 |

EXHIBIT A
TO
RULE 132 DECLARATION (37 C.F.R. 1.132)

BY KURT J. FAGO

Brief Description: "Mule-Hide Products, What's New News Release, Mule-Hide Introduces Self-Bridging Mate-Line, 11/01/2001, www.mulehide.com/news5.html" (cited by the examiner in the Notice of References Cited, accompanying the Office Action dated 02/28/2006, line "U").



What's New

NEWS RELEASE FOR IMMEDIATE RELEASE

RELEASE DATE: 11/1/2001

CONTACT

Kate Baumann, Marketing Director
Mule-Hide Products Co., Inc.
1195 Prince Hall Dr.
Beloit, WI 53511-5481
608-361-6812
kate.baumann@mulehide.com

MULE-HIDE INTRODUCES SELF-BRIDGING MATE-LINE™

Mule-Hide Products Co. Inc., Beloit, Wisconsin, introduces Self-Bridging Mate-Line™. The company's exclusive design for a mate-line tape with built-in bridging material will save labor costs during setup and dismantling of multi-unit modular structures.

"Mule-Hide understands the special needs of multi-unit setups. We custom designed a Mule-Hide Mate Line Bridging System that in recent years has enjoyed wide acceptance as the system of choice. This system employed two products, Mule-Hide Mate-Line Tape along with Bridging Material. Now we've developed this exclusive one-product system using Mule-Hide Self-Bridging Mate-Line. Setup crews quickly learn the system and dealers love its economical speed of installation and dismantling. Crews can expect up to 30 minutes less labor per installed mate-line versus traditional installation methods," explains Mule-Hide Modular Program Manager, Walt Griffin. "Mule-Hide Self-Bridging Mate-Line saves seven to ten percent on material costs and is available in black for black EPDM roofing systems and white for white EPDM roofing systems," states Griffin.

Mule-Hide professional roofing systems to fit modular structures are sold nationwide and in Canada at local distributors near modular plants and offices. Also available are accessories and retrofit materials, such as professional grade, Mule-Hide Elastomeric Acrylic Coatings for metal roof retrofit.



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of)

Inventor: RUST ET AL.)

Title: ROOFING SYSTEM AND SELF-
BRIDGING TAPE FOR MODULAR
BUILDING CONSTRUCTION ROOF
JOINTS)

Serial No. 10/701,153)

Examiner LAUX, JESSICA L.

Filing Date: 11/03/2003)

Group Art Unit 3635

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**DECLARATION OF PRIOR INVENTION IN THE UNITED STATES
OR IN A NAFTA OR WTO MEMBER COUNTRY
TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131)**

I, **Paul Raymond Rust**, a citizen of the United States of America, currently residing at 12247 Browning Street, Evansville, Indiana 47725, make this declaration to establish completion of the Invention in the above-identified Application in the United States, on a date prior to May 22, 2002, that is the effective date of the reference publication US 2003/0219584 (Hubbard) that has been cited by the examiner, and in support thereof, declare as follows:

1. I, and Kurt J. Fago (collectively "we") of South Beloit, Illinois, are co-inventors of the Invention in the Application.

2. Prior to November 1, 2001, we conceived of and developed the Invention (the "self-bridging tape") as shown, described and claimed in the Application.

3. The commercial product that embodies the Invention is manufactured by RPD Inc. of Evansville, Indiana ("RPD"), and is sold by Mule-Hide Products, Inc. of Beloit, Wisconsin ("Mule-hide") under the name Self-Bridging Mate-Line tape.

4. Between about Aug 1991 and Mar 2006, I was President and

Research Director of RPD Inc. of Evansville, Indiana ("RPD"), where my duties included management and oversight of daily operations of RPD, as well as direct involvement in research and development. I am currently Chairman of the Board and Research Director.

5. This Declaration is submitted with

(a) a DECLARATION OF PRIOR INVENTION IN THE UNITED STATES OR IN A NAFTA OR WTO MEMBER COUNTRY TO OVERCOME CITED PATENT OR PUBLICATION (37 C.F.R. 1.131) by Kurt J. Fago (the "Fago 131 Declaration").

(b) a RULE 132 DECLARATION by Kurt J. Fago (the "Fago 132 Declaration"), and

(c) a RULE 132 DECLARATION by myself (the "Rust 132 Declaration").

6. Prior to March 7, 2002, I had made and tested samples of the self-bridging tape, and had found the self-bridging tape to perform satisfactorily for its intended purpose. Prior to this date, I had also made and sent samples of the self-bridging tape to Kurt Fago for testing at Mule-Hide.

7. By March 7, 2002, the self-bridging tape was a fully developed commercial product manufactured by RPD and sold by Mule-Hide.

8. Attached hereto as Exhibit A is a true and correct copy of a document that is (i) a March 7, 2002 fax received by David Mercer, who was at the time the plant manager at RPD, from Kurt Fago; and (ii) a return fax from David Mercer to Kurt Fago of the same date. The typed content of this document shows the fax from Fago to Mercer, and the hand-written content of this document shows the return fax from Mercer to Fago. In the first paragraph of the fax from Fago, he was requesting "more tapes" from RPD which refers to the Mate-Line tape (not the Self-Bridging Mate-Line tape). In the second paragraph of the fax from Fago, he was also requesting the self-bridging tape material with the scrim hanging out for the purpose of taking pictures for press releases and sell sheets. The return fax from Mercer shows that he intended to ship the samples on 3/11/2002, which are the samples of the self-bridging tape material with the scrim hanging out. The "order" referred to in this return fax from Mercer is not related to the self-bridging tape. I was aware of the request from Fago and the reply from Mercer from seeing the fax and conversations I had with Mercer at that time.

9. On March 8, 2002, I authorized shipment of two roles of the self-bridging tape with the scrim hanging out, to Kurt Fago at Mule-hide (which at the time was operating as Kingstree-Mulehide) in reply to his request of 3/7/2002. Attached hereto as Exhibit B is a true and correct copy of an RPD shipping order, dated 3/8/2002, by which this authorization was made. The title "Sample Order" at the top of this document refers to the fact that this form is used to authorize shipment of no-charge product samples to RPD customers. The UPS tracking number affixed to this document, shows that RPD did ship these two roles of self-bridging tape to Kurt Fago on 3/8/2002.

10. On March 3, 2002, I conducted a test on a sample of the self-bridging tape (that was produced on production equipment) in the RPD development test lab. This test was conducted to test a new polyethylene scrim netting in the self-bridging tape. The test involved installation of the self-bridging tape in a small mock-up of an actual anticipated installation, and exposing the installed tape to elevated heat and accelerated aging conditions. Attached hereto as Exhibit C is a true and correct copy of an RPD document, dated 3/8/2002, entitled "Lab Development" which was used in RPD test lab to document test results. I filled in the Results section of this document concerning the test results, initialed it at the bottom, and turned it in for record keeping on 3/8/2002. I also noted that the rolls from this sample were to be used for the 3/7/02 request from Fago for pictures. This document shows that the self-bridging tape sample with the polyethylene scrim manufactured on production equipment was tested and passed the test for "no sag" on a gap of 2 to 3 inches. This document also shows that the self-bridging tape of the Invention had been conceived of, made, used and tested with satisfactory results prior to May 22, 2002.

11. On August 16, 2001, I conducted a test on a sample of the self-bridging tape with a 4 inch wide mesh in the center (that was produced on production equipment) in the RPD development test lab. The test involved installation of the self-bridging tape in a small mock-up of an actual anticipated installation, and exposing the installed tape to elevated heat and accelerated aging conditions. Attached hereto as Exhibit D is a true and correct copy of an RPD document, dated 8/17/01, entitled "Lab Development" which was used in RPD test lab to document test results. I filled in the Results section of this document concerning the test results, initialed it at the bottom, and turned it in for

record keeping on 3/8/2002. This document shows that the self-bridging tape sample with a 4 inch mesh center manufactured on production equipment was tested with satisfactory results. This document also shows that the self-bridging tape of the Invention had been conceived of, made, used and tested with satisfactory results prior to May 22, 2002.

12. Attached hereto as Exhibit E is a true and correct copy of an RPD document entitled "Lab to Production Run" which was used in RPD by production personnel, to document a run of material on production equipment at the request of lab personnel. This document shows that a sample roll of self-bridging tape was 12" x 65' with scrim, .036" thick Butyl, and cover tape substrate. This document shows that the run of the sample tape did not encounter any problems. This document is not dated, but from its location in the RPD files, and by specification of the 12" (wide) tape, I believe that it was a sample self-bridging tape run the first half of August 2001, was the sample self-bridging tape tested on August 16, 2001 (see Exhibit D discussed above) and was the sample self-bridging tape shipped to Kurt Fago on 8/13/01 (see Exhibit F and discussion below).

13. On August 13, 2001, I authorized shipment of one role of the 12" wide self-bridging tape with a 4" scrim (mesh center) to Kurt Fago at Mule-hide (which at the time was operating as Kingstree-Mulehide) for his testing. Attached hereto as Exhibit F is a true and correct copy of an RPD shipping order, dated 8/13/2001, by which this authorization was made. The title "Sample Order" at the top of this document refers to the fact that this form is used to authorize shipment of no-charge product samples to RPD customers. The UPS tracking number affixed to this document, shows that RPD did ship these two roles of self-bridging tape to Kurt Fago on 8/13/2001.

14. Attached hereto as Exhibit G is an undated letter to me from Naltex of Austin, Texas, and a Naltex drawing dated 9/21/01 that accompanied the letter. I signed and dated this drawing above the Customer Approval line on 9/21/01, faxed back the drawing with my approval signature on both 9/21/01 and 9/26/01, and mailed the drawing back to Naltex on 9/21/01. By approving this drawing, I was locking in for RPD the initial approved scrim material specification to setup initial purchasing parameters for future manufacture of self-bridging tape. Certain proprietary information on this

drawing have been blocked over in the attached Exhibit G. This document shows that the self-bridging tape according to the invention

15. Attached hereto as Exhibit H is a two page disclosure, dated March 25, 2002, that I prepared on the self-bridging tape according to the invention, and caused to be faxed to Pam Mereness of Mule-hide. The purpose of this disclosure was to document the self-bridging tape of the invention for review for possible patent protection. This disclosure shows the self-bridging tape of the invention was conceived of, developed and completed prior to May 22, 2002.

16. On 11/01/2002, we filed US Provisional Patent Application S/N 60/423,069 for the invention. A copy of the provisional application is attached to the Fago 131 Declaration as Exhibit C, with a supporting declaration from Attorney Frantz attached thereto as Exhibit B.

17. The present Application was filed while copending with and claiming priority to US Provisional Patent Application S/N 60/423,069 on 11/01/2002.

18. The evidence presented and the documents and things identified above and attached hereto, in conjunction the Fago 131 Declaration, establish conception, diligence and completion of the invention in the United States prior to May 22, 2002, which is a date earlier than the effective date of the reference.

19. This Declaration is submitted with a request for continued examination of the Application.

20. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the Application and any patent issuing thereon.

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Co-Inventor: Paul Raymond Rust

Inventor's Signature: 

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